Massachusetts Institute of Technology
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Cambridge, Massachusetts

LUMINARY Memo #108

To: Distribution

From: B. McCoy

Date: 22 August 1969

Subject: LUMINARY 1B is Revision 116

Luminary 1B was released on 12 August 1969. Since that date two anomalies have been uncovered, both in Rendezvous Radar Designate routines. The R29 routine that designates the antenna during P12 Ascents will not work now; correcting an anomaly concerning shared erasables of V41N72 and a reposition causes the incorrect loading of Desired Shaft angle. The other anomaly is in the P22 pre-designate routine; the antenna can't be designated to the edge of the Mode II limits for the 10 minute wait - a 530 alarm will occur if it is attempted. However, P22 can still be used if it is called as the CSM comes into Mode II limits, so that the pre-designate routine isn't used. Care must be taken to prevent overshoot during the normal designate out of the mode limits. This will cause a reposition, and possibly there won't be enough time left in that pass to catch the CSM in a redesignate after the reposition.

It should be noted that Apollo 11 did not use R29 during its ascent because of the concern over computer time. Also, P22 was only used as another data source for the LM's position; it had to be added to the Flight Plan.

Another anomaly exists in Luminary 1B which was discovered recently, but is considered highly improbable. It also existed in Luminary 1A. It is possible during one two-second interval during Ascent, that the mass is such that an overflow in the DAP state estimator will occur which will cause indeterminate control (?). This is being investigated by the DAP group and an anomaly report is forthcoming. It is to be re-emphasized that this is highly improbable and should it occur, it is for a two second period only and the next 2 second period will correct the problem since the overflow cause will happen only once.

New Subject: Luminary 1B Demonstration. There was an advertisement in a previous Luminary memo concerning a demonstration on MIT's Hybrid of the new features of Luminary 1B. Since the news did not reach distribution until the date of demonstration it was decided to re-issue the invitation. Therefore, the demonstration will now be held on Thursday and Friday (28th and 29th of August). I think it is highly desirable to have representatives from the following groups in attendance:

Flight Control Division
- LM CONTROL OFFICER
- LM GUIDANCE OFFICER
- FLIGHT DYNAMICS OFFICER

Flight Support Division
- AGC Support

Flight Crew Support Division
- LMS Crew Training